

# Hurricanes 101

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The hurricane season began June 1 and ends Nov. 30. Hurricane activity in the western Gulf of Mexico intensifies from the end of July through the middle of September. However, as we learned last year, a tropical storm system could threaten our community at any time over the next six months.

Preparing now for a storm that will threaten us is not only smart but also essential if you and your family plan to evacuate before the roads become congested.

When your evacuation plan and disaster supply kit are prepared in advance, you can be on the road within an hour after local officials recommend evacuation from low-lying areas. Those less-prepared citizens will scramble frantically at the last minute at the local hardware and grocery store for increasingly fewer supplies on the shelves.

In this section, I'll cover what you need to know about hurricanes and being prepared for them. In addition, I encourage you to do your homework and visit <http://mod.jsc.nasa.gov/da5/eoc/Hur02.cfm> and familiarize yourself with Johnson Space Center's Hurricane/Severe Weather Plan, as well as the JSC Employee Hurricane Handbook. You will find other vital JSC-related hurricane information and tips on that Web site.

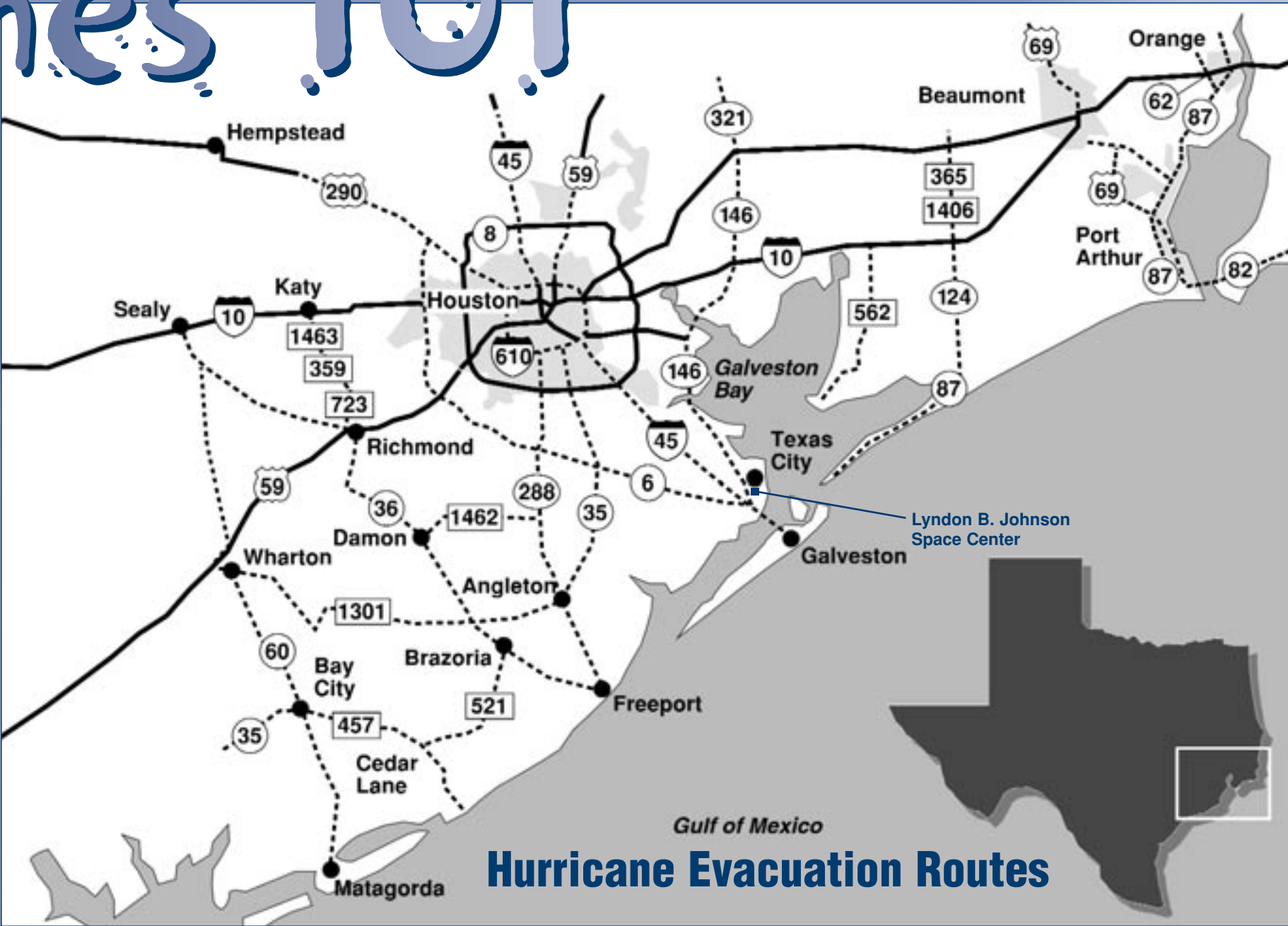
Finally, keep in mind that the Emergency Operations Office will continue to post information about emergency preparedness and the Center's readiness status when a storm threatens. That Web site is <http://mod.jsc.nasa.gov/da5/eoc/>. ❖

## So what exactly is a hurricane?

- ❖ A hurricane is the most severe category of tropical cyclone. Tropical cyclones are low-pressure systems that have thunderstorm activity and rotate counter-clockwise.
- ❖ A tropical cyclone that has winds of 38 mph or less is called a tropical depression.
- ❖ When the tropical cyclone's winds reach 39-73 mph, it is called a tropical storm.
- ❖ When the winds exceed 73 mph, the storm is considered to be a hurricane. The Saffir-Simpson Hurricane Scale (see chart below) defines hurricane strength by categories.
- ❖ A Category 1 storm is the weakest hurricane (winds 74-95 mph); a Category 5 hurricane is the strongest (winds greater than 155 mph). The category of the storm does not necessarily relate directly to the damage it will inflict.
- ❖ Lower category storms (and even tropical storms, such as Tropical Storm Allison) can cause substantial damage depending on what other weather features they interact with, where they strike and how slowly they move.

## Saffir-Simpson Hurricane Scale

Category	Winds (MPH)	Damage
Category 1	Winds: 74-95 mph	Mainly to trees, shrubbery, unanchored mobile homes, boats
Category 2	Winds: 96-110 mph	Considerable amount to trees, some roofs, windows, doors, entire marinas, minor building damage
Category 3	Winds: 111-130 mph	Destruction of large trees, some structural damage inland, damage of small buildings on coast
Category 4	Winds: 131-155 mph	Major damage to lower floors and buildings near coast, extensive structural and roof damage inland
Category 5	Winds: Above 155 mph	Destruction of many roofs, residences and industries; many small buildings blown over or away



“Don't wait until you see a storm coming to determine your plan. Your decision timeline may be faulty and you could put your family and yourself in a dangerous situation. My advice is to evacuate and evacuate early.”

—Bill Roeh, JSC Emergency Operations Office Manager

## The basic hazards of a hurricane

- ❖ The main hazards associated with tropical cyclones and especially hurricanes are storm surge, high winds, heavy rain and flooding, as well as tornadoes.
- ❖ A storm surge is a large dome of water 50- to 100-miles wide, which is the greatest potential threat to life and property associated with hurricanes.
- ❖ Hurricane winds not only damage structures, but the barrage of debris they carry is quite dangerous to anyone unfortunate enough (or unwise enough!) to be caught out in them.
- ❖ Damaging winds begin well before the hurricane eye makes landfall. Tropical cyclones frequently produce huge amounts of rain, and flooding can be a significant problem, particularly for inland communities.
- ❖ A typical hurricane brings at least six to 12 inches of rainfall to the area it crosses.
- ❖ Tornadoes spawned by land-falling hurricanes can cause enormous destruction. As a hurricane moves shoreward, tornadoes often develop on the fringes of the storm.
- ❖ These hazards can bring other consequences not directly related to the storm. For example, hurricane-related deaths and injuries are often the result of fires started by candles used when the electricity fails. Heart attacks and accidents frequently occur during the clean-up phase. And, depending on the industrial facilities in your area, hurricane damage might cause chemical spills that could make the disaster even worse.

## Tropical storms are dangerous too

- ❖ From June 7-15 last year, Tropical Storm Allison left enough rain in the Houston/Galveston area to supply the water needs of the entire U. S. population for one year, according to NOAA.
- ❖ Allison was far-reaching, dumping water and destruction from Houston to the New England states.
- ❖ Allison's death toll was 47, including 22 people locally.
- ❖ Thirty Texas counties were designated as disaster areas in the wake of Tropical Storm Allison.
- ❖ Allison caused more than \$2 billion in damages, making it the most expensive tropical storm in U.S. history.
- ❖ Recent studies of hurricane-related deaths show that in the United States more people die from flooding inland than along the coast from any storm surge.
- ❖ With hurricanes dropping about an inch of rain per hour, effects in low-lying areas can be catastrophic, as demonstrated by the casualties in Tropical Storm Allison's strike in Texas last year.
- ❖ The highest rainfall total reported from Tropical Storm Allison was 36.99 inches at the Port of Houston. By comparison, JSC experienced relatively little flooding and almost no damage while residences further inland were totally destroyed.

“We all found out on Sept. 11 that the unthinkable can happen. While each year we preach that we ‘prepare for the worst and hope for the best,’ this year we are especially mindful of our serious responsibility to prepare JSC for a major event, understand the possible outcomes and return our site to full operations as soon as possible. Personally, I encourage all employees to take their disaster planning a step further than I did last year, when I only thought about what I would do if a major hurricane hit this area.”

—Joel Walker, Acting Director, Center Operations Directorate

## Be aware, be prepared

What would you do with three feet of water (or more) in your home? You and your family should consider evacuating outside the hazard zone until local officials and public health authorities determine the community is safe for citizens to return.

- ❖ Meet with family members to develop an emergency plan and rehearse the plan, including designating an evacuation route and departure time.
- ❖ Establish a meeting place in the event of a family separation. Identify a check-in contact (a family member living outside the threatened area) that the family will call if separated and to keep informed that you're safe.
- ❖ Take your pets and their shot records with you but remember they aren't permitted in the same shelter with people. Pick a destination that has animal boarding facilities nearby.
- ❖ Prepare for family health needs (prescriptions, medical supplies) by stocking up in advance.
- ❖ Don't return too soon since your community utility infrastructure may be damaged and unable to provide convenient services immediately.

## Emergency Numbers

JSC Emergency Information Line . . . x33351  
(toll free) . . . 1-877-283-1947  
JSC Employee News Service . . . x36765  
Emergency . . . 911  
Harris County Flood Control  
(river levels) . . . 713-881-3100  
National Weather Service . . . 281-337-7895  
Texas Highway Department  
(road closures) . . . 1-800-452-9292

### Emergency Management Offices

American Red Cross . . . 713-526-8300  
Galveston County . . . 409-763-5971  
Pasadena . . . 713-943-7000  
Clear Lake Office . . . 281-282-6039  
Baytown . . . 1-281-420-6556  
Clear Lake Shores . . . 281-334-1034  
Deer Park . . . 281-478-7298  
Dickinson . . . 281-337-2489 x261

El Lago . . . 281-326-1951  
Friendswood . . . 281-996-3335  
Galveston (city) . . . 409-766-2102  
Galveston County (north) . . . 281-534-2531 x102  
Galveston County (south) . . . 409-762-8621 x102  
Harris County . . . 713-881-3100  
Hitchcock . . . 409-986-5559  
Houston (city) . . . 713-881-3045  
LaMarque . . . 409-938-9269  
League City . . . 281-338-4836  
Nassau Bay . . . 281-333-4200  
Pasadena . . . 281-475-5588  
Santa Fe . . . 409-925-2000  
Seabrook . . . 281-291-5610  
Taylor Lake Village . . . 281-326-2843  
Texas City . . . 409-643-5707  
Webster . . . 281-333-2712

## What should go into your hurricane preparedness kit?

If you are confined to your home or choose to evacuate as a result of severe weather or disaster, a disaster supply kit can be useful.

- ✓ Keep it readily accessible for safety, comfort and convenience. All household members should know where it is stored.
- ✓ Replace food, water, medical supplies and batteries as needed.
- ✓ Place the items you need during an evacuation in an easy-to-carry container, such as a backpack or plastic storage tub.
- ✓ Select the items your family will need from the suggestions in the Emergency Supply Kit pictured below.
- ✓ Don't use your emergency supply kit at your evacuation destination. You may need it when you return to your community if utilities and grocery stores aren't available for a couple of days. Eat where you are sheltered.

## Emergency Supply Kit

- Flashlight
- Tissues
- Radio
- Pocket Knife
- Sanitary Supplies
  - Toothbrush
  - Soap
  - Shampoo
  - Sponge
  - Cleanser
  - Bleach
- Batteries
- Pencils
- Drinks/Juices
- Nuts
- Rice – Pasta
- Soups
- Canned Foods
- Water (1 gal per person per day)



30-gallon trash barrel

- First-Aid Kit
- Medicines
- Rubbing Alcohol
- First-Aid Handbook
- Towels
- Blankets
- Paper Towels
- Toilet Paper
- Candles
- Matches
- Can Opener
- Peanut Butter
- Crackers
- Dried Beans
- Change of Clothing
- Foul Weather Gear
- Sterno, Stove, Fuel
- Garbage Bags
- Cooking Utensils
  - Cooking Pot
  - Plastic Dishes
  - Silverware
  - Aluminum Foil

4

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Roundup

JSC Center Status:  
<http://www.jsc.nasa.gov/pao/roundup/centerstatus/index/>  
National Weather Service's National Hurricane Center/Tropical Prediction Center:  
<http://www.nhc.noaa.gov>

5

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Roundup